

Tue Dec 23 10:44:44 2003

us-10-068-238-1.rge

Page 2

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1 CCCAATTGAGTAACATA 19

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DEFINITION B. anthracis encapsulation protein genes (capA, capB, and capC),
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VERSION     M24150.1 GI:142630
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REFERENCE  Makino,S., Uchida,I., Terakado,N., Sasakawa,C. and Yoshikawa,M.
            Molecular characterization and protein analysis of the cap region,
            which is essential for encapsulation in Bacillus anthracis
            JOURNAL  U. Bacteriol. 171 (2), 722-730 (1989)
            MEDLINE  89123146
            PUBMED   2536679
COMMENT     Original source text: B. anthracis (strain TE702; isolate pCAP1)
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VERSION     AEO11191.1 GI:20520280
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REFERENCE  Read,T.D., Salzberg,S.L., Pop,M., Shumway,M., Umayam,L., Jiang,L.,
            Holtzapfle,E., Busch,J.D., Smith,K.L., Schnupp,J.M., Solomon,D.,
            Keim,P. and Frazer,C.M.
            Comparative genome sequencing for discovery of novel polymorphisms
            in Bacillus anthracis
            JOURNAL  Science 286 (5575), 2028-2033 (2002)
            MEDLINE  22061436
            PUBMED   12004073
            2 (bases 1 to 94829)
REFERENCE  Read,T.D., Salzberg,S.L., Pop,M., Shumway,M., Umayam,L., Jiang,L.,
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            Keim,P. and Frazer,C.M.
            Direct Submission
            JOURNAL  Submitted (09-MAY-2002) The Institute for Genomic Research, 5712
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DEFINITION
  B. anthracis encapsulation protein genes (capA, capB, and capC),
  complete cds.
ACCESSION
  M24150.1 GI:142630
VERSION
  M24150
KEYWORDS
  encapsulation protein; membrane-associated protein.
SOURCE
  Bacillus anthracis
ORGANISM
  Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus
  cereus group.
  1 (bases 1 to 3244)
  Makino, S., Uchida, I., Terakado, N., Sasakawa, C. and Yoshikawa, M.
  Molecular characterization and protein analysis of the cap region,
  which is essential for encapsulation in Bacillus anthracis
  J. Bacteriol. 171 (2), 722-730 (1989)
  89123146
  2536679
COMMENT
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RESULT 2  
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LOCUS 3244 bp DNA linear BCT 26-APR-1993  
DEFINITION B. anthracis encapsulation protein genes (capA, capB, and capC), complete cds.  
ACCESSION M24150.1 GI:142630  
VERSION M24150.1  
KEYWORDS encapsulation protein; membrane-associated protein.  
SOURCE Bacillus anthracis  
ORGANISM Bacillus anthracis  
Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus cereus group.  
1 (bases 1 to 3244)  
Makino, S., Uchida, I., Terakado, N., Sasakawa, C. and Yoshikawa, M.  
Molecular characterization and protein analysis of the cap region, which is essential for encapsulation in Bacillus anthracis  
J. Bacteriol. 171 (2), 722-730 (1989)  
89123146  
MEDLINE 2536679  
PUBMED  
COMMENT Original source text: B. anthracis (strain 78702; isolate pCAP1) DNA  
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VERSION AB011191.1 GI:20520280  
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Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus cereus group.  
1 (bases 1 to 94829)  
Read, T.D., Salzberrg, S.L., Pop, M., Shumway, M., Umayam, L., Jiang, L.,  
Holzapfel, E., Busch, J.D., Smith, K.L., Schupp, J.M., Solomon, D.,  
Keim, P. and Fraser, C.M.  
Comparative genome sequencing for discovery of novel polymorphisms in Bacillus anthracis  
Science 296 (5575), 2028-2033 (2002)  
12004073  
2 (bases 1 to 94829)  
Read, T.D., Salzberrg, S.L., Pop, M., Shumway, M., Umayam, L., Jiang, L.,  
Holzapfel, E., Busch, J.D., Smith, K.L., Schupp, J.M., Solomon, D.,  
Keim, P. and Fraser, C.M.  
Direct Submission  
Submitted (09-MAY-2002) The Institute for Genomic Research, 9712  
Medical Center Dr, Rockville, MD 20850, USA  
Location/Qualifiers  
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## RESULT 2

## BACCAPABC

LOCUS BACCAPABC 3244 bp DNA linear BCT 26-Apr-1993  
DEFINITION B. anthracis encapsulation protein genes (capA, capB, and capC),  
complete cds.  
ACCESSION M24150.1 GI:142630  
VERSION M24150.1  
KEYWORDS encapsulation protein; membrane-associated protein.  
SOURCE Bacillus anthracis  
ORGANISM Bacillus anthracis  
Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus  
cereus group.  
1 (bases 1 to 3244)  
Makino, S., Uchida, I., Terakado, N., Sasakawa, C. and Yoshikawa, M.  
Molecular characterization and protein analysis of the cap region,  
which is essential for encapsulation in Bacillus anthracis  
J. Bacteriol. 171 (2), 722-730 (1989)  
JOURNAL MEDLINE 89123146  
PUBMED 2536679

REFERENCE DN.  
Draft entry and computer-readable sequence for [1] kindly provided  
by I. Uchida, 01-MAY-1989.  
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## CDS

## CDS

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BASE COUNT 1120 a 458 c 697 g 965 t  
ORIGIN 748 bp upstream of HindIII site.

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## RESULT 3

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LOCUS AE011191 94829 bp DNA circular BCT 14-JUN-2002  
DEFINITION Bacillus anthracis str. A2012 plasmid pXO2, complete sequence.  
ACCESSION AE011191  
VERSION AE011191.1 GI:20520280  
KEYWORDS  
SOURCE Bacillus anthracis str. A2012  
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1 (bases 1 to 94829)  
Read, T.D., Salzberg, S.L., Pop, M., Shumway, M., Umayam, L., Jiang, L.,  
Holtzapfel, E., Busch, J.D., Smith, K.L., Schupp, J.M., Solomon, D.,  
Keim, P. and Fraser, C.M.  
Comparative genome sequencing for discovery of novel polymorphisms  
in Bacillus anthracis  
Science 296 (5575), 2028-2033 (2002)  
JOURNAL MEDLINE 12061436  
PUBMED 12004073

REFERENCE 2 (bases 1 to 94829)  
Read, T.D., Salzberg, S.L., Pop, M., Shumway, M., Umayam, L., Jiang, L.,  
Holtzapfel, E., Busch, J.D., Smith, K.L., Schupp, J.M., Solomon, D.,  
Keim, P. and Fraser, C.M.  
Direct Submission  
Submitted (09-MAY-2002) The Institute for Genomic Research, 9712  
Medical Center Dr, Rockville, MD 20850, USA  
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## CDS

## gene

## gene

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GNLOYOQKDLTEFPNPDQOOSNITKQALBELNATNITYLVDKIKNAKNNILIRKR  
FHYDRNNIAVAGADSVKAEAREVINSSTGGLNIDKDKIRKILSGIYIEIDTEBLK  
EVIDRNDMNISSLRODGKTFIDFKKYNDRPLIYISNPNKYAVAVTMENTIINPS  
ENGSTNGIKKILIFSKGGEIG"

BASE COUNT 924 a 338 c 441 g 666 t

ORIGIN

Query Match 100.0%; Score 19; DB 1; Length 2369;  
Best Local Similarity 100.0%; Pred. No. 8.4;  
Matches 19; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Db 852 TACAGAGCGATTGATTAAG 870

QY 1 TACAGAGCGATTGATTAAG 19  
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RESULT 12  
AF306779  
LOCUS  
DEFINITION  
ACCESSION  
VERSION  
KEYWORDS  
SOURCE  
ORGANISM  
REFERENCE  
AUTHORS  
TITLE  
JOURNAL  
MEDLINE  
PUBMED  
REFERENCE  
AUTHORS  
TITLE  
JOURNAL  
FEATURES  
SOURCE

AF306779 2369 bp DNA linear BCT 13-DEC-2000  
Bacillus anthracis isolate 28 protective antigen (pag) gene,  
complete cds.  
AF306779  
AF306779.1 GI:10880944  
Bacillus anthracis  
Bacillus anthracis  
Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus  
cereus group.  
1 (bases 1 to 2369)  
Price, L.B., Hugh-Jones, M., Jackson, P.J. and Keim, P.  
Genetic diversity in the protective antigen gene of *Bacillus*  
anthracis  
J. Bacteriol. 181 (8), 2358-2362 (1999)  
99214082  
10197996  
2 (bases 1 to 2369)  
Price, L.B., Hugh-Jones, M., Jackson, P.J. and Keim, P.  
Direct Submission  
Submitted (20-SEP-2000) Biological Sciences, Northern Arizona  
University, P.O. Box 5640, Flagstaff, AZ 86011-5640, USA  
Location/Qualifiers  
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EGYVDVYKRTFLSPMISNHEKGLTKYKSSPEKSTASDPDEKVTGRIDKNV  
SPEARHPLVAAPYIVHVDMENTILSKNEDOSTONTDQRTISKNTSRTHTSEVHG  
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NAODPFSTPTTMMYNOFLEKTKOLRLPTDOYGNATYFENFENRVRDUSNMSE  
VLPOIETETARIIPNGKDLNVERRIAANVSDPLETETKADTKALKAIFGSEFEN  
GNLOYOQKDLTEFPNPDQOOSNITKQALBELNATNITYLVDKIKNAKNNILIRKR  
FHYDRNNIAVAGADSVKAEAREVINSSTGGLNIDKDKIRKILSGIYIEIDTEBLK  
EVIDRNDMNISSLRODGKTFIDFKKYNDRPLIYISNPNKYAVAVTMENTIINPS  
ENGSTNGIKKILIFSKGGEIG"

BASE COUNT 924 a 339 c 441 g 665 t

NAODPFSTPTTMMYNOFLEKTKOLRLPTDOYGNATYFENFENRVRDUSNMSE  
VLPOIETETARIIPNGKDLNVERRIAANVSDPLETETKADTKALKAIFGSEFEN  
GNLOYOQKDLTEFPNPDQOOSNITKQALBELNATNITYLVDKIKNAKNNILIRKR  
FHYDRNNIAVAGADSVKAEAREVINSSTGGLNIDKDKIRKILSGIYIEIDTEBLK  
EVIDRNDMNISSLRODGKTFIDFKKYNDRPLIYISNPNKYAVAVTMENTIINPS  
ENGSTNGIKKILIFSKGGEIG"

BASE COUNT 924 a 337 c 441 g 667 t

ORIGIN

Query Match 100.0%; Score 19; DB 1; Length 2369;  
Best Local Similarity 100.0%; Pred. No. 8.4;  
Matches 19; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Db 852 TACAGAGCGATTGATTAAG 870

QY 1 TACAGAGCGATTGATTAAG 19  
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RESULT 13  
AF306780  
LOCUS  
DEFINITION  
ACCESSION  
VERSION  
KEYWORDS  
SOURCE  
ORGANISM  
REFERENCE  
AUTHORS  
TITLE  
JOURNAL  
MEDLINE  
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REFERENCE  
AUTHORS  
TITLE  
JOURNAL  
FEATURES  
SOURCE

AF306780 2369 bp DNA linear BCT 13-DEC-2000  
Bacillus anthracis isolate BA1035 protective antigen (pag) gene,  
complete cds.  
AF306780  
AF306780.1 GI:10880946  
Bacillus anthracis  
Bacillus anthracis  
Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus  
cereus group.  
1 (bases 1 to 2369)  
Price, L.B., Hugh-Jones, M., Jackson, P.J. and Keim, P.  
Genetic diversity in the protective antigen gene of *Bacillus*  
anthracis  
J. Bacteriol. 181 (8), 2358-2362 (1999)  
99214082  
10197996  
2 (bases 1 to 2369)  
Price, L.B., Hugh-Jones, M., Jackson, P.J. and Keim, P.  
Direct Submission  
Submitted (20-SEP-2000) Biological Sciences, Northern Arizona  
University, P.O. Box 5640, Flagstaff, AZ 86011-5640, USA  
Location/Qualifiers  
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49..2343  
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FKLWYDSQNKKEVSSDNQLPELKQSSNSRKRSAGTPVDPDRNDGIDSLV  
EGYVDVYKRTFLSPMISNHEKGLTKYKSSPEKSTASDPDEKVTGRIDKNV  
SPEARHPLVAAPYIVHVDMENTILSKNEDOSTONTDQRTISKNTSRTHTSEVHG  
NAEYHASFEDIGGSVSAFSSNSSTVAIDHSLSAERTWAEATMGNTADTARLAN  
IRYVNTGAPYVNLPTTSLVAGKQVLATIKAKENQLSQILANNYYSKNIAPIAL  
NAODPFSTPTTMMYNOFLEKTKOLRLPTDOYGNATYFENFENRVRDUSNMSE  
VLPOIETETARIIPNGKDLNVERRIAANVSDPLETETKADTKALKAIFGSEFEN  
GNLOYOQKDLTEFPNPDQOOSNITKQALBELNATNITYLVDKIKNAKNNILIRKR  
FHYDRNNIAVAGADSVKAEAREVINSSTGGLNIDKDKIRKILSGIYIEIDTEBLK  
EVIDRNDMNISSLRODGKTFIDFKKYNDRPLIYISNPNKYAVAVTMENTIINPS  
ENGSTNGIKKILIFSKGGEIG"

BASE COUNT 924 a 337 c 441 g 667 t

QY 1 TACAGAGCGATTGATTAAG 19

VERSION AJ413936.1 GI:16031492  
 KEYWORDS pag gene  
 SOURCE Bacillus anthracis  
 ORGANISM Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus cereus group.

REFERENCE 1  
 Adone, R., Pasquali, P., La Rosa, G., Marianelli, C., Muscillo, M., Fasanella, A., Francia, M. and Cluchini, F.  
 Sequence analysis of the gene encoding for the major virulence factors of bacillus anthracis vaccine strain 'Carbosap 2' (bases 1 to 2231)  
 J. Appl. Microbiol. 92, 1-5 (2002)

REFERENCE 2  
 Muscillo, M.  
 Direct Submission  
 Submitted (11-SEP-2001) Muscillo M., Environmental Hygiene, Istituto Superiore di Sanita, Viale Regina Elena 299, Rome 00199, Italy

FEATURES  
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 /strain="Carbosap"  
 /isolate="IT-Carb3-6254"  
 /db\_xref="taxon:1392"  
 /plasmid="pX01"  
 /country="Italy"  
 /note="vaccine against anthrax in cattle and sheep"

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BASE COUNT 861 a 328 c 422 g 620 t

ORIGIN

Query Match 100.0%; Score 18; DB 1; Length 2231;  
 Best Local Similarity 100.0%; Pred. No. 1e+02;  
 Matches 18; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

CY 1 TTTCAGCCCAAGTCTTT 18  
 Db 1109 TTTCAGCCCAAGTCTTT 1092

RESULT 10  
 AF306778/c  
 LOCUS AF306778 2369 bp DNA linear BCT 13-DEC-2000  
 DEFINITION Bacillus anthracis plasmid pX01 protective antigen (pag) gene,  
 complete cds.  
 ACCESSION AF306778  
 VERSION AF306778.1 GI:10880942  
 KEYWORDS

SOURCE  
 ORGANISM Bacillus anthracis  
 Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus cereus group.

REFERENCE 1  
 Price, L.B., Hugh-Jones, M., Jackson, P.J. and Keim, P.  
 Genetic diversity in the protective antigen gene of Bacillus anthracis  
 J. Bacteriol. 181 (8), 2358-2362 (1999)

REFERENCE 2  
 Price, L.B., Hugh-Jones, M., Jackson, P.J. and Keim, P.  
 Direct Submission  
 Submitted (20-SEP-2000) Biological Sciences, Northern Arizona University, P.O. Box 5640, Flagstaff, AZ 86011-5640, USA

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BASE COUNT 924 a 338 c 441 g 666 t

ORIGIN

Query Match 100.0%; Score 18; DB 1; Length 2369;  
 Best Local Similarity 100.0%; Pred. No. 1e+02;  
 Matches 18; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

CY 1 TTTCAGCCCAAGTCTTT 18  
 Db 1180 TTTCAGCCCAAGTCTTT 1163

RESULT 11  
 AF306779/c  
 LOCUS AF306779 2369 bp DNA linear BCT 13-DEC-2000  
 DEFINITION Bacillus anthracis isolate 28 protective antigen (pag) gene,  
 complete cds.  
 ACCESSION AF306779  
 VERSION AF306779.1 GI:10880944  
 KEYWORDS  
 SOURCE Bacillus anthracis  
 ORGANISM Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus cereus group.

REFERENCE 1  
 Price, L.B., Hugh-Jones, M., Jackson, P.J. and Keim, P.  
 Genetic diversity in the protective antigen gene of Bacillus anthracis



VERSION AJ413936.1 GI:16031492  
 KEYWORDS pag gene.  
 SOURCE Bacillus anthracis  
 ORGANISM Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus cereus group.

REFERENCE 1  
 AUTHORS Adone, R., Pasquali, P., La Rosa, G., Marianelli, C., Muscillo, M., Fasanella, A., Francia, M. and Cluchini, F.  
 TITLE Sequence analysis of the gene encoding for the major virulence factors of Bacillus anthracis vaccine strain 'Cardosap'  
 JOURNAL J. Appl. Microbiol. 92, 1-5 (2002)  
 REFERENCE 2 (bases 1 to 2231)  
 AUTHORS Muscillo, M.  
 TITLE Direct Submission  
 JOURNAL Submitted (11-SEP-2001) Muscillo M., Environmental Hygiene, Istituto Superiore di Sanita, Viale Regina Elena 299, Rome 00199, Italy

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 AVGAEVSVKAEHREIVINSSTEGILLINDIRKILSGYIVLEIDEGKEVINDYD  
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 GIK"

BASE COUNT 861 a 328 c 422 g 620 t  
 ORIGIN

Query Match 100.0%; Score 23; DB 1; Length 2231;  
 Best Local Similarity 100.0%; Pred. No. 3;  
 Matches 23; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Cy 1 ATGGCTGCTCTTGATATTGGT 23  
 Db 993 ATGGCTGCTCTTGATATTGGT 1015

RESULT 10  
 AF306778 2369 bp DNA linear BCT 13-DEC-2000  
 LOCUS Bacillus anthracis plasmid pX01 protective antigen (pag) gene,  
 DEFINITION complete cds.  
 ACCESSION AF306778  
 VERSION AF306778.1 GI:10880942  
 KEYWORDS

SOURCE Bacillus anthracis  
 ORGANISM Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus cereus group.

REFERENCE 1  
 AUTHORS Price, L.B., Hugh-Jones, M., Jackson, P.J. and Keim, P.  
 TITLE Genetic diversity in the protective antigen gene of Bacillus anthracis  
 JOURNAL J. Bacteriol. 181 (8), 2358-2362 (1999)  
 MEDLINE 99214082  
 PUBMED 10197996  
 REFERENCE 2 (bases 1 to 2369)  
 AUTHORS Price, L.B., Hugh-Jones, M., Jackson, P.J. and Keim, P.  
 TITLE Direct Submission  
 JOURNAL Submitted (20-SEP-2000) Biological Sciences, Northern Arizona University, P.O. Box 5640, Flagstaff, AZ 86011-5640, USA

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 TPTIYVNOFLELEKTKQLRLDTQVGNATATTPENGRVYDTSNMSEVLPQIET  
 TARTTNGKDLNVERIAAVNPSPDLETTPMTLKEALKIAGNEPFGALQYQK  
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 GIK"

BASE COUNT 924 a 338 c 441 g 666 t  
 ORIGIN

Query Match 100.0%; Score 23; DB 1; Length 2369;  
 Best Local Similarity 100.0%; Pred. No. 3;  
 Matches 23; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Cy 1 ATGGCTGCTCTTGATATTGGT 23  
 Db 1064 ATGGCTGCTCTTGATATTGGT 1086

RESULT 11  
 AF306779 2369 bp DNA linear BCT 13-DEC-2000  
 LOCUS Bacillus anthracis isolate 28 protective antigen (pag) gene,  
 DEFINITION complete cds.  
 ACCESSION AF306779  
 VERSION AF306779.1 GI:10880944  
 KEYWORDS

ORGANISM Bacillus anthracis  
 Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus cereus group.

REFERENCE 1 (bases 1 to 2369)  
 AUTHORS Price, L.B., Hugh-Jones, M., Jackson, P.J. and Keim, P.  
 TITLE Genetic diversity in the protective antigen gene of Bacillus anthracis



BASE COUNT 987 a 294 c 442 g 695 t  
 ORIGIN

Query Match 100.0%; Score 20; DB 1; Length 2418;  
 Best Local Similarity 100.0%; Pred. No. 46;  
 Matches 20; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

1 TTTTACCGATATTACTCTCC 20  
 1905 TTTTACCGATATTACTCTCC 1924

## RESULT 4

LOCUS BACLEFB 3291 bp DNA linear BCT 12-OCT-1995  
 DEFINITION Bacillus anthracis lethal factor (lef) gene, complete cds.  
 ACCESSION M30210.1 GI:143143  
 VERSION M30210.1 GI:143143  
 KEYWORDS anthrax toxin; exotoxin.  
 SOURCE Bacillus anthracis  
 ORGANISM Bacillus anthracis  
 Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus cereus group.

REFERENCE 1 (bases 1 to 3291)  
 AUTHORS Bragg, J.S. and Robertson, D.L.  
 TITLE Nucleotide sequence and analysis of the lethal factor gene (lef) from Bacillus anthracis  
 JOURNAL Gene 81 (1), 45-54 (1989)  
 MEDLINE 90034185  
 PUBMED 2509294  
 COMMENT Original source text: Bacillus anthracis (clone: pLF74) DNA.  
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 /db\_xref="GI:143144"  
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## CDS

481..579  
 /note="lethal factor signal peptide"  
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 /product="lethal factor"  
 BASE COUNT 1333 a 391 c 564 g 1003 t  
 ORIGIN

Query Match 100.0%; Score 20; DB 1; Length 3291;  
 Best Local Similarity 100.0%; Pred. No. 43;

Matches 20; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
 1 TTTTACCGATATTACTCTCC 20  
 2469 TTTTACCGATATTACTCTCC 2488

## RESULT 5

LOCUS 133395 3291 bp DNA linear PAT 06-FEB-1997  
 DEFINITION Sequence 1 from patent US 5591631.  
 ACCESSION 133395  
 VERSION 133395.1 GI:1824186  
 KEYWORDS  
 SOURCE Unknown.  
 ORGANISM Unknown.

REFERENCE 1 (bases 1 to 3291)  
 AUTHORS Leppla, S.H., Kimpel, K.R., Arora, N., Singh, Y. and Nicholls, P.J.  
 TITLE Anthrax toxin fusion proteins, nucleic acid encoding same  
 JOURNAL Patent: US 5591631-A 1 07-JAN-1997;  
 FEATURES Location/Qualifiers  
 source 1..3291  
 /organism="unknown"  
 BASE COUNT 1333 a 391 c 564 g 1003 t  
 ORIGIN

Query Match 100.0%; Score 20; DB 6; Length 3291;  
 Best Local Similarity 100.0%; Pred. No. 43;  
 Matches 20; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

1 TTTTACCGATATTACTCTCC 20  
 2469 TTTTACCGATATTACTCTCC 2488

## RESULT 6

LOCUS 169373 3291 bp DNA linear PAT 04-FEB-1998  
 DEFINITION Sequence 1 from patent US 5677274.  
 ACCESSION 169373  
 VERSION 169373.1 GI:2831495  
 KEYWORDS  
 SOURCE Unknown.  
 ORGANISM Unknown.

REFERENCE 1 (bases 1 to 3291)  
 AUTHORS Leppla, S.H., Kimpel, K.R., Arora, N., Singh, Y. and Nicholls, P.J.  
 TITLE Anthrax toxin fusion proteins and related methods  
 JOURNAL Patent: US 5677274-A 1 14-OCT-1997;  
 FEATURES Location/Qualifiers  
 source 1..3291  
 /organism="unknown"

BASE COUNT 1333 a 391 c 564 g 1003 t  
 ORIGIN  
 Query Match 100.0%; Score 20; DB 6; Length 3291;  
 Best Local Similarity 100.0%; Pred. No. 43;  
 Matches 20; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

1 TTTTACCGATATTACTCTCC 20  
 2469 TTTTACCGATATTACTCTCC 2488

## RESULT 7

LOCUS BACLEFB 3631 bp DNA linear BCT 26-APR-1993  
 DEFINITION B-anthraxis plasmid pX01 lethal factor (lef) gene, complete cds.  
 ACCESSION M30210.1 GI:143141  
 VERSION M30210.1 GI:143141  
 KEYWORDS lethal factor.  
 SOURCE Bacillus anthracis

SEB 10 NO:9

SEQ ID NO: 10

LTATGADIVDTNTKINGINEFKKPKYSSNYMTVDINERPALDNERIKRI  
 QLSPTDTRAGYHENGKILIKONVIGLEIVDOQIKQSEKEXYRIDAQVPSKIDTKIOE  
 AQLINQENKALDLPKTYKLTITFNVRNRYASNVAYLILNKNKLNQSDILIKKVT  
 NYLVGNGRPFVFTDITLPTNIAEQYTHODEIYEQVSKGLVFPESRSLILHGPCKGVEL  
 RNDSGFIHERFGAVDDYAGLIDKNQSDILNKSQSDILTFKESGSLTSGYRTNAB  
 FFAAFRLMSTHDHARLKVQKNAPKTFQPINQIKRIINS"

BASE COUNT 987 a 294 c 442 g 695 t  
 ORIGIN

Query Match 100.0%; Score 17; DB 1; Length 2418;  
 Best Local Similarity 100.0%; Pred. No. 1.5e+02;  
 Matches 17; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 AACCTAAGGCTTCGC 17  
 DB 2243 AACCTAAGGCTTCGC 2227

# RESULT 4 BACLEB/c

LOCUS BACLEB 3291 bp DNA linear BCT 12-OCT-1995  
 DEFINITION Bacillus anthracis lethal factor (lef) gene, complete cds.  
 ACCESSION M29081.1 GI:143143  
 VERSION M29081.1  
 KEYWORDS anthrax toxin; exotoxin.  
 SOURCE Bacillus anthracis  
 ORGANISM Bacillus anthracis  
 Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus  
 cereus group.

REFERENCE 1 (bases 1 to 3291)  
 AUTHORS Bregg, T.S. and Robertson, D.L.  
 TITLE Nucleotide sequence and analysis of the lethal factor gene (lef)  
 from Bacillus anthracis  
 JOURNAL Gene 81 (1), 45-54 (1989)  
 MEDLINE 90034185  
 PUBMED 2509294

COMMENT Original source text: Bacillus anthracis (clone: pLF74) DNA.  
 FEATURES Location/Qualifiers

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 /clone="pLF74"  
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 /db\_xref="GI:143144"

CDS

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 VLVVQSEDEYVENTEKALNYYEIGKLSIDLSKIQPKYOKELDVLTNKNASDSG  
 QDLFTQKLEHPTDFSEVFELEONSNEVOFAFAFAYIEPHODVLTOLAAEASDY  
 MDKNEOEINLSLELDOORMLSYEKMEKIKOYQWMSDSLSEEGSLIKKICITIE  
 PKKDDIHLSLQSEKELKIKCIDSSEKPEKTCICIDRISLSEKELIN  
 IOWSNRPLSEKKEPKLAKLDIQPDINORLODTGLIDSSINDVKKYKRIQ  
 NIDALHQSIGSTIYINKIYIENMNINNLRAIGADIVDSTDTKINRGLFENFKKVO  
 KYISISNYMIVDINERPALDNERLKWRIQSPDRADYENGKLIIGRNGLIKIKVO  
 IIKQSEKEXYRIDAQVPSKIDTKIOEQALINQENKALGPKYTKLITFNVRNRY  
 ASNVAYLILNKNKNIQSDILIKKVTNYLVGNGRPFVFTDITLPTNIAEQYTHODEI  
 YEQVSKGLVFPESRSLILHGPCKGVELRNDSGFIHERFGAVDDYAGLIDKNQSDIL  
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 580..2907  
 /product="lethal factor"

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 mat\_peptide  
 BASE COUNT 1333 a 391 c 564 g 1003 t

ORIGIN

Query Match 100.0%; Score 17; DB 1; Length 3291;  
 Best Local Similarity 100.0%; Pred. No. 1.5e+02;

Matches 17; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 AACCTAAGGCTTCGC 17  
 DB 2807 AACCTAAGGCTTCGC 2791

RESULT 5  
 LOCUS 133395 3291 bp DNA linear PAT 06-FEB-1997  
 DEFINITION Sequence 1 from patent US 5591631.  
 ACCESSION 133395  
 VERSION 133395.1 GI:1824186  
 KEYWORDS  
 SOURCE Unknown.  
 ORGANISM Unknown.  
 Unclassified.

REFERENCE 1 (bases 1 to 3291)  
 AUTHORS Leppla, S.H., Klimpel, K.R., Arora, N., Singh, Y. and Nicholls, P.J.  
 TITLE Anthrax toxin fusion proteins: nucleic acid encoding same  
 JOURNAL Patent: US 5591631-A 1 07-JAN-1997;  
 FEATURES Location/Qualifiers

1..3291  
 /organism="unknown"  
 BASE COUNT 1333 a 391 c 564 g 1003 t  
 ORIGIN

Query Match 100.0%; Score 17; DB 6; Length 3291;  
 Best Local Similarity 100.0%; Pred. No. 1.5e+02;  
 Matches 17; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 AACCTAAGGCTTCGC 17  
 DB 2807 AACCTAAGGCTTCGC 2791

RESULT 6  
 LOCUS 169373 3291 bp DNA linear PAT 04-FEB-1998  
 DEFINITION Sequence 1 from patent US 5677274.  
 ACCESSION 169373  
 VERSION 169373.1 GI:2831495  
 KEYWORDS  
 SOURCE Unknown.  
 ORGANISM Unknown.  
 Unclassified.

REFERENCE 1 (bases 1 to 3291)  
 AUTHORS Leppla, S.H., Klimpel, K.R., Arora, N., Singh, Y. and Nichols, P.J.  
 TITLE Anthrax toxin fusion proteins and related methods  
 JOURNAL Patent: US 5677274-A 1 14-OCT-1997;  
 FEATURES Location/Qualifiers

1..3291  
 /organism="unknown"  
 BASE COUNT 1333 a 391 c 564 g 1003 t  
 ORIGIN

Query Match 100.0%; Score 17; DB 6; Length 3291;  
 Best Local Similarity 100.0%; Pred. No. 1.5e+02;  
 Matches 17; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 AACCTAAGGCTTCGC 17  
 DB 2807 AACCTAAGGCTTCGC 2791

RESULT 7  
 LOCUS BACLEB/c 3631 bp DNA linear BCT 26-APR-1993  
 DEFINITION B anthracis plasmid pX01 lethal factor (lef) gene, complete cds.  
 ACCESSION M30210  
 VERSION M30210.1 GI:143141  
 KEYWORDS lethal factor.  
 SOURCE Bacillus anthracis

LTATLACADLVSTDNKINRGIFNEFKKNFKYSISSNMYIVDINERPALDNBLKRI  
 OLSPTBAGYLENGKLILOBNIGLEIKVOI IKOSEKXYRIDAKVYPSKIDTIOE  
 AGLNINOMENKALIGPKYTKLITPVNHRVSNIVESAYLINEMKNINOSDILKXVT  
 NYLVNNGRFVFTDITLIRIAGQYTHQDEIYEQYHSGVLYPERSILLGSPKGYEL  
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BASE COUNT 987 a 442 g 695 t  
 ORIGIN

Query Match 100.0%; Score 22; DB 1; Length 2418;  
 Best Local Similarity 100.0%; Pred. No. 16;  
 Matches 22; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Cy 1 ATTAAGGATGATGAGGCT 22  
 Db 2043 ATTAAGGATGATGAGGCT 2064

# RESULT 4 BACTERIA

LOCUS BACTERIA 3291 bp DNA linear BCT 12-OCT-1995  
 DEFINITION Bacillus anthracis lethal factor (lef) gene, complete cds.  
 ACCESSION M29081  
 VERSION M29081.1 GI:143143  
 KEYWORDS anthrax toxin; exotoxin.  
 SOURCE Bacillus anthracis  
 ORGANISM Bacillus anthracis  
 Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus  
 cereus group.

REFERENCE 1 (bases 1 to 3291)  
 Bragg, T.S. and Robertson, D.L.  
 Nucleotide sequence and analysis of the lethal factor gene (lef)  
 from Bacillus anthracis  
 Gene 81 (1), 45-54 (1989)  
 JOURNAL 90034185  
 MEDLINE 2509294  
 PUBMED  
 COMMENT Original  
 FEATURES  
 source

## CDS

location/Qualifiers  
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 /protein\_id="AA079216.1"  
 /db\_xref="GI:143144"  
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 VLEWYKAIGKLIYVDGDIKHI,SLKALSEDDKKIKDIYQKDLIHEHYVAKGPEP  
 VLVLOSSEYDVENTKALNYYEIGKLSRDILSKINOPYQKDLVLTINQASDSG  
 ODLLFTNQ,KEHPTDPSVEFLQNSNVEQVPAKAPAYIEQHDVQLAPAPAVY  
 MDKNEQEI,SLBELKDOMLSRYEKMKIKOHQOHMSDS,SEEGRLKKLQIPPE  
 PKKDDIHSL,SOEKKIKR,IOIDSDPITSEKIKR,IOIDSDPITSEKIKR,IOIDSDPITSEKIKR  
 IOVDSNP,SEKKEPKIKKIDIPYDINQ,LOOTG,ISIDRPS,INDPKQYRQDIO  
 NIDAL,HSIGSTLTKIYIYENKNNIN,PLATGADLVDSITNTKINGITNEKRAK  
 KYSTISSNMYIVDINERPALDNBLKRIQ,LSPTBAGYLENGKLILOBNIGLEIKVOI  
 IKOSEKXYRIDAKVYPSKIDTIOE,SLQKQ,VLNOMENKALIGPKYTKLITPVNHRV  
 ASNIVESAYLINEMKNINOSDILKXVT,LYLVNNGRFVFTDITLIRIAGQYTHQDEI  
 YEQYHSGVLYPERSILLGSPKGYELKNDSEGFIEHFGHVVDDTAGTLDKQSDLVNKSQFIDFKESGSMVTSYGRINAE  
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 /product="lethal factor"

BASE COUNT 1333 a 564 g 1003 t  
 ORIGIN

Query Match 100.0%; Score 22; DB 1; Length 3291;  
 Best Local Similarity 100.0%; Pred. No. 16;

Matches 22; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
 Cy 1 ATTAAGGATGATGAGGCT 22  
 Db 2607 ATTAAGGATGATGAGGCT 2628

## RESULT 5

LOCUS 133395 3291 bp DNA linear PAT 06-FEB-1997  
 DEFINITION Sequence 1 from patent US 5591631.  
 ACCESSION 133395  
 VERSION 133395.1 GI:1824186  
 KEYWORDS  
 SOURCE Unknown.  
 ORGANISM Unknown.

REFERENCE 1 (bases 1 to 3291)  
 Leppla, S.H., Klimpel, K.R., Arora, N., Singh, Y., and Nicholls, P.J.  
 Anthrax toxin fusion proteins, nucleic acid encoding same  
 Patent: US 5591631-A 1 07-JAN-1997;  
 location/Qualifiers  
 1..3291  
 /organism="unknown"

BASE COUNT 1333 a 564 g 1003 t  
 ORIGIN

Query Match 100.0%; Score 22; DB 6; Length 3291;  
 Best Local Similarity 100.0%; Pred. No. 16;  
 Matches 22; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Cy 1 ATTAAGGATGATGAGGCT 22  
 Db 2607 ATTAAGGATGATGAGGCT 2628

## RESULT 6

LOCUS 169373 3291 bp DNA linear PAT 04-FEB-1998  
 DEFINITION Sequence 1 from patent US 5677274.  
 ACCESSION 169373  
 VERSION 169373.1 GI:2831495  
 KEYWORDS  
 SOURCE Unknown.  
 ORGANISM Unknown.

REFERENCE 1 (bases 1 to 3291)  
 Leppla, S.H., Klimpel, K.R., Arora, N., Singh, Y., and Nicholls, P.J.  
 Anthrax toxin fusion proteins and related methods  
 Patent: US 5677274-A 1 14-OCT-1997;  
 location/Qualifiers  
 1..3291  
 /organism="unknown"

BASE COUNT 1333 a 564 g 1003 t  
 ORIGIN

Query Match 100.0%; Score 22; DB 6; Length 3291;  
 Best Local Similarity 100.0%; Pred. No. 16;  
 Matches 22; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

Cy 1 ATTAAGGATGATGAGGCT 22  
 Db 2607 ATTAAGGATGATGAGGCT 2628

## RESULT 7

LOCUS BACTERIA 3631 bp DNA linear BCT 26-APR-1993  
 DEFINITION B. anthracis plasmid pX01 lethal factor (lef) gene, complete cds.  
 ACCESSION M30210  
 VERSION M30210.1 GI:143141  
 KEYWORDS lethal factor.  
 SOURCE Bacillus anthracis

REC ID NO.12

BASE COUNT 987 a 294 c 442 g 695 t  
 ORIGIN  
 Query Match 100.0%; Score 22; DB 1; Length 2418;  
 Best Local Similarity 100.0%; Pred. No. 2.4;  
 Matches 22; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 TATACAGAAATTGGACATGCT 22  
 DB 2067 TATACAGAAATTGGACATGCT 2088

RESULT 4  
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 LOCUS 3291 bp DNA linear BCT 12-OCT-1995  
 DEFINITION Bacillus anthracis lethal factor (lef) gene, complete cds.  
 ACCESSION M29081 GI:143143  
 VERSION M29081.1  
 KEYWORDS anthrax toxin; exotoxin.  
 SOURCE Bacillus anthracis  
 ORGANISM Bacillus anthracis  
 Bacteria; Firmicutes; Bacillales; Bacillaceae; Bacillus; Bacillus cereus group.

REFERENCE 1 (bases 1 to 3291)  
 AUTHORS Bragg, T.S. and Robertson, D.L.  
 TITLE Nucleotide sequence and analysis of the lethal factor gene (lef) from Bacillus anthracis  
 JOURNAL Gene 81 (1), 45-54 (1989)  
 MEDLINE 90034185  
 PUBMED 2509294  
 COMMENT Original

FEATURES  
 source location/Qualifiers  
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 /mol\_type="genomic DNA"  
 /db\_xref="taxon:1392"  
 /clone="pLF74"  
 481..2910  
 /note="lethal factor precursor"  
 /codon\_start=1  
 /transl\_table=1  
 /protein\_id="AA079216.1"  
 /db\_xref="GI:143144"

CDS

translation="MNIRKFKIVISWSCIYATITLSPVPIPIVQAGGHDVGMHV  
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 VLEMYKAGKIYVDGDIIRHISLESEKXKIKIYKGDALLHEHYAKGIRP  
 VLVQSSSEYVENTEKALVYVEIGKISRDILSKINQYKQDLVNTIKNASDSG  
 ODLEFTNOLKEHPTDFSVLEPQNSNEVEYKAFAYIPQHRDYLOQVAPAFY  
 MDKPEKQINSLIEELKQDMISRYEKKEKIKOHQMSDLSIEGGLKQIPIE  
 PKKDIIHSISQEEKELKRIQSDSDFLSTKQIDIRDSISEEKEKLNLR  
 IGVDSNPLSEKKEKFLKKIDIDPYINORLODTGGLDPSGINLDPKQYRDO  
 NIDALLHOSIGSTLYNKIYLYENMNINLITLGADVDSTDNKIRNGIRKPKP  
 KYSISNTMIVDINERPALDNERKRIQLSPDTAGYLENGKALQNLNLEKDKQ  
 IIKOSEKEYIRIDAKVPSKIDTKIOAQINQENKALGLPYTKLITFVNHNRY  
 ASNIVESATILINEMQNIQSDLIKVTNYVQNGRFTFDITLPTNAEQYTHQDEI  
 YEOVSKGLVYPSERSILLHGPSKGVLEKRNDEGPIHFGHADVQVAGYLDKQSDI  
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 /product="lethal factor"  
 BASE COUNT 1333 a 391 c 564 g 1003 t  
 ORIGIN  
 Query Match 100.0%; Score 22; DB 1; Length 3291;  
 Best Local Similarity 100.0%; Pred. No. 2.4;

Matches 22; Conservative 0; Mismatches 0; Indels 0; Gaps 0;  
 QY 1 TATACAGAAATTGGACATGCT 22  
 DB 2631 TATACAGAAATTGGACATGCT 2652

RESULT 5  
 LOCUS 13395 3291 bp DNA linear PAT 06-FEB-1997  
 DEFINITION Sequence 1 from patent US 5591631.  
 ACCESSION 13395  
 VERSION 13395.1 GI:1824186  
 KEYWORDS  
 SOURCE Unknown.  
 ORGANISM Unknown.  
 REFERENCE 1 (bases 1 to 3291)  
 AUTHORS Leppla, S.H., Klimpel, K.R., Arora, N., Singh, Y. and Nicholls, P.J.  
 TITLE Anthrax toxin fusion proteins, nucleic acid encoding same  
 JOURNAL Patent: US 5591631-A 1 07-JAN-1997;  
 FEATURES Location/Qualifiers  
 1..3291  
 /organism="unknown"

BASE COUNT 1333 a 391 c 564 g 1003 t  
 ORIGIN  
 Query Match 100.0%; Score 22; DB 6; Length 3291;  
 Best Local Similarity 100.0%; Pred. No. 2.4;  
 Matches 22; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 TATACAGAAATTGGACATGCT 22  
 DB 2631 TATACAGAAATTGGACATGCT 2652

RESULT 6  
 LOCUS 169373 3291 bp DNA linear PAT 04-FEB-1998  
 DEFINITION Sequence 1 from patent US 5677274.  
 ACCESSION 169373  
 VERSION 169373.1 GI:2831495  
 KEYWORDS  
 SOURCE Unknown.  
 ORGANISM Unknown.  
 REFERENCE 1 (bases 1 to 3291)  
 AUTHORS Leppla, S.H., Klimpel, K.R., Arora, N., Singh, Y. and Nicholls, P.J.  
 TITLE Anthrax toxin fusion proteins and related methods  
 JOURNAL Patent: US 5677274-A 1 14-OCT-1997;  
 FEATURES Location/Qualifiers  
 1..3291  
 /organism="unknown"

BASE COUNT 1333 a 391 c 564 g 1003 t  
 ORIGIN  
 Query Match 100.0%; Score 22; DB 6; Length 3291;  
 Best Local Similarity 100.0%; Pred. No. 2.4;  
 Matches 22; Conservative 0; Mismatches 0; Indels 0; Gaps 0;

QY 1 TATACAGAAATTGGACATGCT 22  
 DB 2631 TATACAGAAATTGGACATGCT 2652  
 RESULT 7  
 BACLEF  
 LOCUS 3631 bp DNA linear BCT 26-APR-1993  
 DEFINITION B.anthraxis plasmid pX01 lethal factor (lef) gene, complete cds.  
 ACCESSION M30210  
 VERSION M30210.1 GI:143141  
 KEYWORDS lethal factor.  
 SOURCE Bacillus anthracis